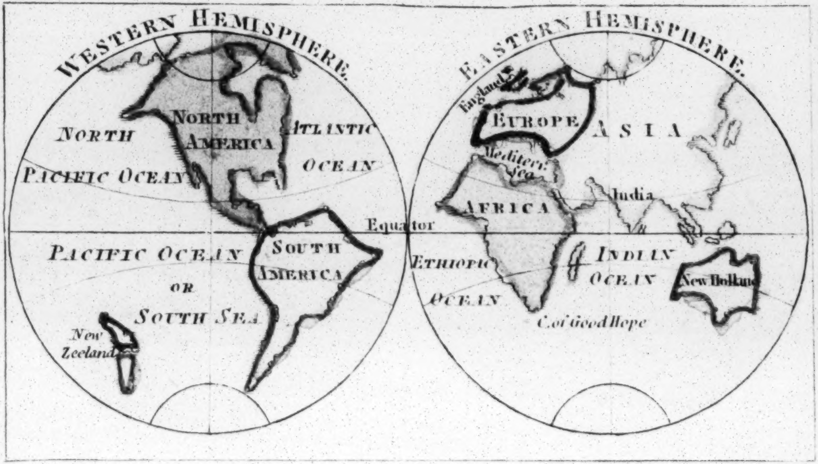
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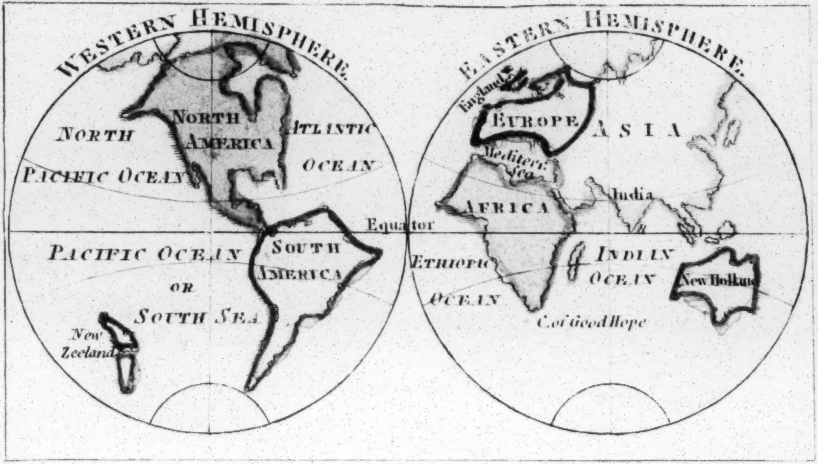
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GEOGRAPHY

AND

ASTRONOMY

Familiarized.

FOR

YOUTH OF BOTH SEXES.

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GEOGRAPHY.

GEOGRAPHY is the deſcription of the globe of the Earth, as made up of land and water.

Land is called by different names, according to its quantity or ſituation.

A large extent of land, not ſurrounded or interrupted by water, is called a Continent, as Europe.

A tract of land, ſurrounded

by water, is called an iſland, as Great Britain.

A tract of land, almoſt ſurrounded by water, is called a Peninſula, as Africa.

A neck of land which joins a Peninſula to the Continent, is called an Iſthmus, as that of Suez.

A neck of land running out into the ſea, is called a Cape, as that of Good Hope.

Water, in like manner, has it's different names.

A large extent of water, not ſurrounded or interrupted by land, is called an Ocean, as the Pacific.

A leſs extent of water is called Sea, as the Baltic.

A quantity of water ſurrounded by land, is called a Lake, as that of Geneva.

A quantity of water which runs into and is almoſt ſurrounded by land, is called a Gulf, as the Adriatic.

A narrow channel of water, which joins the two Seas, or a gulf to a ſea, is called a Strait, as that of Gibraltar.

The land is divided into four parts, Europe, Aſia, Africa, and America. Europe is the leaſt of the four parts. Aſia was the firſt inhabited. America has its name from Americus Veſputius, a Florentine; but was firſt diſcovered by Chriſtopher Columbus, a native of Genoa in the ſervice of Spain, in the year 1492.

EUROPE

Is bounded North by the Northern Sea; W. by the Atlantic Ocean; S. by the Mediterranean; E. by Aſia.

Europe is divided into nine great parts, diſtinguiſhed by the Northern, Middle and Southern. The Northern parts are, the Britiſh Iſles, Scandinavia, and Muſcovy; the Middle parts are, France, Germany, and Poland. The Southern parts are Spain, Italy, and Turkey in Europe.

The Britiſh Iſles comprehend England, Scotland, and Ireland. In the year 1707, during the reign of Queen Anne, England and Scotland were united, and have been ſince called Great Britain.

England is divided into ſix circuits, namely, the Northern, Midland, Norfolk, Home, Oxford, Weſtern.

The Northern circuit contains ſix counties, Yorkſhire, Durham, Northumberland, Lancaſhire, Weſtmoreland, Cumberland.

The Midland circuit, contains ſeven counties, Warwickſhire, Leiceſterſhire, Derbyſhire, Nottinghamſhire, Lincolnſhire, Rutlandſhire, Northamptonſhire.

The Norfolk circuit contains ſix counties, Buckinghamſhire, Bedfordſhire, Huntingdonſhire, Cambridgeſhire, Suffolk, Norfolk.

The Home circuit contains five counties, Hertfortſhire, Eſſex, Kent, Surrey, Suſſex.

The Oxford circuit contains eight counties, Berkſhire, Worceſterſhire, Glouceſterſhire, Oxfordſhire, Monmouthſhire, Herefordſhire, Shropſhire, Staffordſhire.

The Weſtern circuit contains ſix counties, Hampſhire, Wiltſhire, Dorſetſhire, Somerſetſhire, Devonſhire, Cornwall.

Middleſex, being the ſeat of the ſupreme courts of juſtice, is not comprehended in any circuit; and Cheſhire, being a county palatine, and having its own judges, is likewiſe omitted.

The principal rivers in England are, the Severn, Thames, Trent, Ouſe, Humber, Dee, Tyne, and Tweed.

The principality of Wales contains twelve counties, and is divided into North and South Wales.

The northern counties are, Flintſhire, Denbighſhire, the Iſle of Angleſea, Carnarvonſhire, Merionethſhire, Montgomeryſhire.

The Southern counties are, Radnorſhire, Brecknockſhire, Glamorganſhire, Carmarthenſhire, Pembrokeſhire, Cardiganſhire.

Scotland, formerly called Caledonia, is ſituated to the north of England; from which it is ſeparated by the river Tweed and the Solway Firth. It is divided into two general parts: North Scotland, or the Highlands, containing thirteen counties; South Scotland, or the Lowlands, containing 22 counties, being ſeparated by the river Tay.

Ireland is divided into four large parts or provinces: to the North, Ulſter, containing 10 counties; to the Eaſt, Leinſter, containing 11 counties; to the South, Munſter, containing ſix counties; and to the Weſt, Connaught, containing five counties; total number of counties in Ireland 32.

The principal river in Ireland is the Shannon; beſides the river Boyne, famous for the battle gained by the glorious King William the IIId. againſt King James the IId. on the 1ſt of July, 1690.

There are many ſmall Iſles belonging to Great Britain. On the North, the Orkneys, or the Orcades, and the Shetland Iſles. On the South, the Iſles of Wight, off the coaſt of Hampſhire, near Portſmouth. There are likewiſe four iſlands lying near the coaſt of France, Jerſey, Guernſey, Alderney, and Sark. On the Weſt, the Scilly Iſlands, off the coaſt of Cornwall, and the Iſle of Man between England and Ireland; and ſome iſlands, as Sky, &c. off the Weſtern coaſt of Scotland.

A S I A.

The Northern boundary of Aſia is the Northern Sea, and parts unknown.

On the Weſt, it is bounded by Europe, the Mediterranean and part of Africa. On the South by the Indian Ocean. On the Eaſt by the Pacific Ocean.

Aſia may be divided into eight great parts, two towards the North and ſix toward the South.

The two Northern parts are Georgia and great Tartary.

The ſix Southern parts are, Turkey, in Aſia, Arabia, the Empire of Perſia, the Empire of the Great Mogul, the Empire of China, and the Aſiatic Iſlands.

Georgia is tributary to the Grand Signior, the greateſt part of which tribute is paid in ſlaves. It is ſituated between the Euxine and Caſpian Seas: chief town Teflis.

Great Tartary, (ſo called to diſtinguiſh it from Little or Crim Tartary, which makes part of Europe) is a very extenſive country, taking up all the northern part, and near one-third of Aſia. It is divided into ſeveral parts, ſubject to the particular Chams, being a ſavage, and in a great meaſure an unknown country, as the extent of it is quite uncertain: chief city, Samarkand. The other principal towns are Aſtracan and Bokara.

Turkey in Aſia: chief towns Aleppo, Jeruſalem, Damaſcus, Erzerum, ſituated in the inland parts; Joppa, Tyre, Sidon, Tripoli, Laodicea, Antioch, Scandaroon, or Alexandretta, and Smyrna, all lying on the coaſt of the Mediterranean Sea.

The principal rivers are Euphrates and Tigris.

Arabia: chief town Mecca, famous for the birth, Medina, for the burial-place of Mahomet; and Moca.

The Empire of Perſia: chief town Iſpahan.

India, or the Empire of the Great Mogul. This country, one of the greateſt and richeſt in all Aſia; takes its name from the river Indus. It may properly be divided into three parts; Indoſtan, or the empire of the Mogul; the weſtern peninſula on this ſide the Ganges; and the eaſtern peninſula beyond the Ganges.

Indoſtan, or the Empire of the Mogul: chief towns Delhi, Agra, Lahor, and Patna.

The weſtern peninſula on this ſide of the Ganges contains the kingdom of Golconda, upon the coaſt of which are Vizakapatan, and Maſſulapatan; beſides the coaſts of Coromandel and Malabar.

Upon the coaſt of Coromandel is Fort St. David's, Fort

St. George, or Madras, belonging to the Engliſh, and Pondicherry to the French. On the Malabar coaſt are Angengo, Callicut, Tellicherry, the iſland and town of Bombay, all belonging to the Engliſh. Goa belongs to the Portugueze.

The eaſtern peninſula beyond the Ganges : chief towns Pegu, Siam, and Malacca.

The rivers are Ganges and Indus.

The Empire of China : chief towns, Pekin, Nankin and Canton.

The Aſiatic Iſlands.

The Ladrone Iſlands, in the Pacific Ocean.

Japan Iſlands in the Chineſe Sea.

The Philippine or Manilla Iſlands, in the Chineſe Sea.

The Moluccas, or Clove Iſlands, belonging to the Dutch.

Banda, or Nutmeg Iſlands; with many other ſpice iſlands, chiefly belonging to the Dutch, amongſt which is Amboyna.

The Sunda Iſlands, ſituated in the Indian Ocean; namely, Borneo, Sumatra: chief town Bencoolen.

Java: chief towns, Batavia

and Bantam. The iſland of Ceylon, or Cinnamon.

The Maldive Iſlands, comprehending an almoſt infinite number of Iſlands, few exceeding 7 miles in circuit, and are ſeparated by dangerous ſtraits.

AFRICA

Is bounded on the Northward, by the Mediterranean Sea; Weſt, by the Æthiopic and Atlantic Oceans; South, by the Southern Ocean; Eaſt, by the Indian Ocean, the Red Sea, and part of Aſia. It is a peninſula, joined to Aſia by the isthmus of Suez. The middle part of it is ſuppoſed to be moſtly deſart and barren; for no travellers have been able to extend their enquiries ſo far.

It may be divided into 12 parts, ſix towards the north, and ſix towards the South.

The ſix northern parts are, Barbary, Bildulgerid, Egypt, Zaara, or the Deſart, Nigritia, or the land of the Blacks, and Guinea.

The ſix ſouthern parts are, Nubia, Abyſſinia, Congo or Lower Guinea, Zanquebar, Monomotapa, and Cafraria.

Barbary extends along the ſouthern coaſt of the Mediterranean, being the moſt conſiderable and beſt peopled part of Africa; is tributary to the Grand Signior, and governed by many ſovereigns; its chief city is Fez; beſides Morocco, ſubject to its own Emperor; Ceuta, on the African ſide of the Straits of Gibraltar; Algiers, Tunis, and Tripoli.

Bildulgerid is a deſaft country, was the ancient Numidia, and now chiefly inhabited by wandering Arabs.

Egypt, chief town, Grand Cairo; near which was the ancient city of Memphis; Suez, a port on the Red Sea, which gives name to that iſthmus which ſeparates Africa from Aſia; Roſetta, and Alexandria.

The principal river is the Nile. The Red Sea lies between Africa and Aſia.

Zaara, or the Deſart, is an inland country, and very little known; its chief town Zuenziga.

Nigritia, or the land of the Blacks; chief town Tombut. The rivers are, Niger, Gambia, and the river Senegal.

Guinea: chief city, Arda.

Nubia: chief town Nubia.

Abyſſinia: chief town Arquico, near the Red Sea.

Congo: chief town St. Salvadore.

Zanguebar : chief town Moſambique.

· Monomotapa : chief town Monomotapa.

Cafraria ; in the ſouth-weſtern extremity of it is the Cape of Good Hope, now belonging to the Engliſh ; the Hottentots inhabit a part of this country. The chief iſland about Africa is Madagaſcar ; beſides which, are the Isles of Cape Verd, belonging to the Portugueze, in the Atlantic Ocean ; as are the Canary Iſlands, belonging to the Spaniards ; among which is Teneriffe, famous for its lofty mountains ;

and the iſland of Madeira, belonging to the Portugueze; and St. Helena, to the Engliſh: which is a ſteep high rock, in the middle of the Atlantic Ocean: at which place all the homeward-bound Eaſt India ſhips ſtop to get freſh water and freſh proviſions: and the Mauritius, belonging to the French, in the Indian Ocean.

AMERICA.

The Northern boundary of America, is found to be the Frozen Ocean. It is divided from the Aſiatic Continent, on the north-eaſt, by a ſhallow

Strait not more than 10 leagues wide; in the narroweſt part whereof, the Aſiatic and American ſhores may be clearly diſcerned. On the weſt, it is bounded by Pacific Ocean: on ſouth, the by the Southern Ocean; on the eaſt, by the Southern and Atlantic Oceans. It is divided into north and ſouth, by an iſthmus or neck of land, at Darien or Panama.

The beſt diviſion of North-America at this time may be, into the dominions of Spain, the United States of America, and Great Britain.

The dominions of Spain

contain Old Mexico, New Mexico, and California, once reckoned the greateſt iſland in the world, but now known to be part of the American Continent; Louiſiana and the two Floridas.

Old Mexico: chief towns Mexico, La Vera Cruz, Truxillo, and Acapulco.

New Mexico, or New Granada; chief town Santa Fee.

The dominions belonging to the United States of America are bounded on the North by Nova Scotia and Canada; on the South by Florida and the Great River Miſſiſſippi; on the

Weſt by the Lakes, and on the Eaſt by the Atlantic Ocean. They contain 13 provinces; namely, New Hampſhire, Maſſachuſets Bay, Rhode Iſland, and Providence Plantations. Connecticut, New York, New Jerſey, Pennſylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, which, on the 30th of November, 1782, were declared free and independent ſtates.

The dominions belonging to Great Britain are, Nova Scotia: chief towns Annapolis and Halifax. Canada: chief towns

Quebec and Montreal. New Britain, or Eſkemaux: chief town Port Nelſon.

The Iſlands belonging to Great Britain are, part of Newfoundland, Jamaica, St. Chriſtopher's, vulgarly called St. Kitt's, Antigua, Nevis, Dominica, Barbadoes, Grenada and the Grenadines; Barbuda, Montſerrat, and St. Vincent: and, except Newfoundland, and other iſlands are diſtinguiſhed by the general name of the Caribbee Iſlands.

Iſlands belonging to Spain are, Cuba: chief towns Havannah, Hiſpaniola, or St. Domingo, part belonging to the French, and part to the Spaniards : Porto Rico ; the Virgin Iſlands. Trinidad, and Margaretta ; Martinique and Guadaloupe, belonging to the French.

The principal rivers in North America are, the Miſſiſſippi, the Ohio, and the river St. Lawrence.

SOUTH-AMERICA

May be divided into 7 parts, Terra Firma, Peru, the country of Amazons, Brazil, formerly called the province of Santa Croix, the province of

Plata or Paraguay, Chili and Terra Magellanica.

Terra Firma, ſo called by Chriſtopher Columbus: chief towns Panama, Porto Bello, Carthagena. Peru: chief towns Lima, Payta, and Truxillo. Brazil: chief town St. Salvadore: a country belonging to the Portugueze. Paraguay, or Rio de la Plata: chief towns Aſſumption and Buenos Ayres. Chili: chief towns St. Jago, and Baldivia.

Terra Magellanica (the moſt ſouthern part of the Continent of South America, which is alſo called Patagonia) derives its name from Ferdinand Magellan, a Portugueze, who firſt diſcovered it in the year 1519; as alſo that famous ſtrait which ſtill bears his name. Not far from hence is Falkland Iſland.

South of that ſtrait is an iſland, called Terra del Fuego, at the ſouthern extremity of which lies Cape Horn. The river of the Amazons is the principal river in South America, and is ſaid to be the largeſt river in the world. There is alſo the river of Paraguay, or Rio de la Plata.

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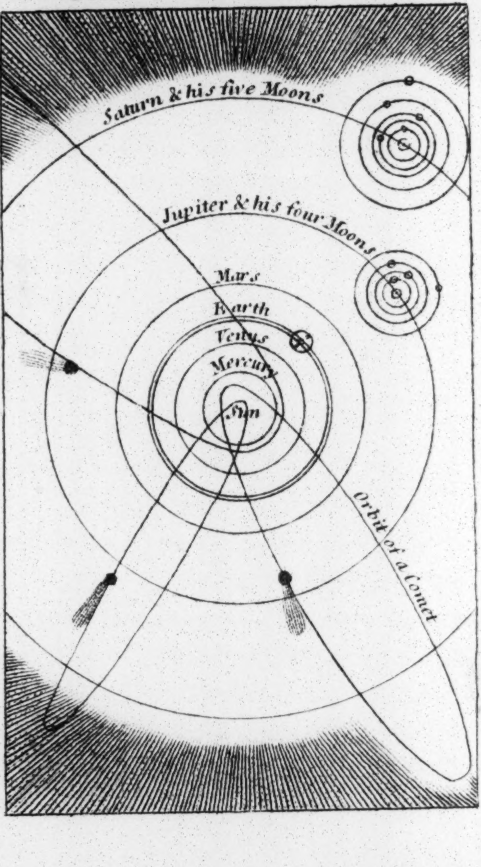
THE SOLAR SYSTEM.



ASTRONOMY.

THE SOLAR SYSTEM.

THE Solar Syſtem is compoſed of the Sun, with the Planets and Comets which move round him.

Near the centre of this regular and beautiful ſyſtem is

THE SUN,

which is an immenſe globe of fire, the fountain of light, and principle of vegetation ; to its influence we owe the changes of the ſeaſons, the healthfulneſs of Spring, the beauties of Summer, and the luxuriancy of Autumn ; nor is it further removed from us in Winter but to return again to reſtore the face of nature, and to bleſs us with plenteouſneſs ; how admirably too has that Being who directs all things tempered its beams to the ſtate of man, that in its midnoon it ſhall not hurt him, while, under its kindly ray the bloſſom expands, the fruit ripens, and the harveſt is brought to perfection.

The Sun remains ſtationary in the Heavens but turns upon its own axis in about 25½ days. There are ſeven planets moving round him, each in a different orbit. The orbit of a planet is the path it deſcribes in the Heavens, which is nearly circular.

The names of the planets according to the order of their diſtance from the Sun, are, *Mercury*, *Venus*, the *Earth*, *Mars*, *Jupiter*, *Saturn*, and the *Georgidum Sidus*. The two firſt, Mercury and Venus, are called *inferior* planets, becauſe they move within the Earth's orbit; that is, nearer to the Sun. The four laſt are called *ſuperior* planets, becauſe their orbits are without that of the Earth.

The figure of the planets is

that of a ſphere or globe ; and they turn continually upon their own axis from weſt to eaſt, at the ſame time, by a progreſſive motion through their orbits from weſt to eaſt, they revolve round the Sun, which is ſtationary in the centre. They have no light of their own, but ſhine by means of the borrowed light which they receive from the Sun.

The axis of a planet is a line conceived to be drawn through its centre on which it revolves or goes round. A bowl whirled from one's hand into the air turns round ſuch a line within itſelf, while it moves forward ; ſuch are the lines we mean when we ſpeak of the axis of the heavenly bodies.

MERCURY

Is the neareſt planet to the Sun, and moves round him in rather leſs than three months, which is the length of his year ; the year being the ſpace of time a planet takes in going round the Sun. Mercury is ſeldom ſeen, on account of his being ſo near to the Sun as to be moſtly concealed by his rays. The time of his rotation on his axis, or the length of his days and nights, is not yet known.

VENUS,

The next planet to Mercury, makes her yearly revolution round the Sun in about 7½ months; and her diurnal or daily rotation upon her own axis in about 23½ hours. When this planet appears to the weſt of the Sun, ſhe riſes before him in the morning, and is called the Morning Star. When ſhe appears to the Eaſt of the Sun, ſhe ſhines in the evening after he ſets, and is then called the Evening Star; being in each ſituation, alternately, for about 7½ months.

THE EARTH.

The annual revolution of this planet is performed in 365 days, 5 hours, and 49 minutes, or rather more than twelve months; and its diurnal rotation in about 24 hours. Every fourth year, one day is added at the end of February, to recover the time which the Earth ſpends in her annual courſe above the 365 days, which compoſe a common year. This fourth year, therefore, conſiſts of 366 days, and is called Biſſextile, and alſo Leap-year.

MARS.

This planet completes his revolution round the Sun in ſomewhat leſs than two of our years, and his rotation upon his axis is rather more than 24½ hours.

JUPITER

is the largeſt of all the planets, and moves in the next orbit to Mars. He performs his annual revolution in rather leſs than 12 years, and his diurnal rotation in about 10 hours. Jupiter, as well as Venus, is ſometimes the morning and evening Star.

SATURN

Completes his annual revolution round the Sun in about 29½ years. The time of his diurnal rotation is not known at preſent ; Saturn was conſidered as the remoteſt planet of our ſyſtem, till, on the 13th of March, 1781, when Dr. Herſchel diſcovered another, ſtill more diſtant from the Sun, round which it revolves in an orbit nearly circular in about 82 years. To this planet he has given the name of the Georgium Sidus.

OF THE SATELLITES.

A Satellite is a ſmaller or ſecondary planet which moves round the larger or primary, in the ſame manner as they do round the Sun; there are fourteen of them in number. The firſt of theſe ſatellites is

THE MOON;

Which, while ſhe is the attendant of the Earth in its annual progreſs through its orbit, is conſtantly revolving round it; and this revolution ſhe performs in about 29½ days. Her diſtance from the Earth is 24,000 miles. As the ſame face of the Moon is always towards us, it is evident that ſhe turns only once round upon her axis in the time of each revolution round the Earth, ſo that the inhabitants of the Moon, (if there be any) have but one day and one night in the courſe of a month. When the Moon is between the Earth and the Sun, ſhe is ſaid to be in conjunction with him: then the whole of her enlightened hemiſphere is turned from the Earth, and ſhe is called a New Moon. When ſhe has advanced thro' one quarter of her orbit we ſee part of her enlightened hemiſphere in the form of a ſemicircle, and the Moon is then ſaid to be at her firſt quarter. When ſhe has gone through half her orbit, the whole enlightened hemiſphere is towards the Earth, and ſhe is in oppoſition to the Sun, and is called a Full Moon. The Sun and Moon are at this time in oppoſite parts of the heavens; the Moon riſing in the eaſt as the Sun ſets in the weſt. When the Moon has proceeded thro' three quarters of her orbit, ſhe enters her laſt quarter, and again appears ſemi-circular. When ſhe has made her revolution, the whole enlightened hemiſphere again becomes inviſible, and we have another *New Moon*. From the New to the Full Moon, the enlightened part is turned towards the weſt, becauſe the Sun is then weſtward of it; but from the Full to the New Moon, it is turned to the eaſt; juſt before the autumnal equinox, the Full Moon appears larger at her riſing than uſual, and riſes nearly at the ſame hour for ſeveral evenings together, immediately after the Full, and is commonly called the Harveſt Moon. Theſe circumſtances are owing to its peculiar ſituation at theſe periods with reſpect to the Earth; a particular explanation of which is not altogether neceſſary to the young ſtudent in Aſtronomy.

Jupiter has four ſatellites or moons, Saturn ſeven, and the Georgium Sidus two; theſe, like the primary planets, ſhine only by reflecting the light which they receive from the Sun.

Saturn has, beſides his ſeven ſatellites, a luminous or ſhining ring, which encompaſſes him; but at ſo great a diſtance from his body, that the fixed ſtars may frequently be ſeen between the inner ſurface of the ring and the planet itſelf. Dr. Herſchel has lately diſcovered that this ring is divided into two parts, an inner and an outer ring, which are ſeparated from each other by a ſpace of one thouſand miles.

The ſatellites of the planets and Saturn's ring, cannot be ſeen by the naked eye; Jupiter's belts are ſeveral faint parallel ſtripes on his body, ſcarcely diſcernable.

COMETS.

It has been found, from a variety of obſervations, that theſe bodies, which are ſolid and opaque, move round the Sun, and croſs the orbits of the planets in all manner of directions. They are of various magnitudes, like the planets;

from which they are known by their long tranſparent tails, which reſemble a pale flame, and iſſue from that ſide of the comet which is the furtheſt from the Sun. Theſe bodies move in very extenſive orbits like long ovals, of ſuch vaſt circumferences, that at one period of their courſe they are ſo near to the Sun, as to be almoſt melted by his heat, and then go off again to diſtances ſo immenſe, that they muſt be entirely deprived both of his heat and light.

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The Solar Syſtem, as deſcribed here, was taught by th philoſopher Pythagoras among the ancients, and was reſtored by Nicholas Copernicus, a Swede, in the year 1473.

The Ptolomæan Syſtem, ſo called from Ptolomæus, an Egyptian philoſopher, ſuppoſed the Earth to be the centre, and that the Sun and planets moved round the Earth.

The firſt ſyſtem was however demonſtrated by Sir Iſaac Newton, to be the true one.

How admirable is the beauty and harmony of this wonderful ſyſtem, where the planet keeps the path preſcribed him, and has conſtantly revolved in the ſame order and progreſſion from the beginning of the world!

NAMES OF THE PLANETS.

☿ *Mercury*, performs its periodical revolution round the ſun in 87 days, 23 hours, 15½ ſeconds, and is diſtant from the ſun 37,000,000 Engliſh miles.

♀ *Venus*, revolves round the ſun in 224 days, 16 hours, 49½ ſeconds; performs its diurnal rotation in 23 hours, 22 minutes, and is diſtant from the ſun 68,000,000 miles.

⊕ *The Earth* revolves round

the ſun 365 days in 5 hours, 49 ſeconds; performs its diurnal rotation 23 hours, 56 minutes 4 ſeconds, and is diſtant from the ſun 95,000,000 miles.

♂ *Mars*, revolves round the ſun in 686 days, 23 hours, 30¾ ſeconds; performs its diurnal rotation in 24 hours, 39 minutes, 22 ſeconds, and is diſtant from the ſun 144,000,000 miles.

♃ *Jupiter* revolves round the ſun in 4332 days, 8 hours, 51½ ſeconds; performs its diurnal rotation in 9 hours, 56 minutes, and is diſtant from the ſun 490,000,000 miles.

♄ *Saturn* revolves round the

ſun in 10,761 days, 14 hours, 36¾ minutes; and is diſtant from the ſun 900,000,000 miles.

Georgium Sidus revolves round the ſun in 30,445 days, 18 hours, and is diſtant from it 1,800,000,000.

OF THE FIXED STARS.

The Stars are ſaid to be fixed, becauſe they never alter their ſituation like the planets; for though the revolutions of the Earth occaſion an apparent motion of the heavens, yet, if any two fixed ſtars be obſerved at ſeveral intervals of time, they will always be found to keep the ſame poſition with reſpect to each other.

It is ſuppoſed, that theſe ſtars are Suns placed at vaſt diſtances in the immenſe univerſe; each ſhining by its own light, and ſituated in the centre of a ſyſtem, in which planets revolve round them as round our Sun, but too much removed from the Earth to be viſible to us; as their light is only borrowed from their Suns, and is therefore too faint to reach to ſuch a diſtance.

The diſtance of the fixed ſtars from us is ſo immenſe, that even the neareſt of them, the Dog-ſtar, never appears to vary in its dimenſions to us, though the Earth, in its annual revolution, is 195 millions of miles nearer to it when in one part of its orbit than when in that which is oppoſite.

The largeſt of the fixed ſtars are called of the firſt magnitude; thoſe which appear ſomewhat leſs, of the ſecond; and ſo on to the ſixth; theſe are ſuch as are viſible without a teleſcope. The number which may be ſeen with the naked eye at once, is not more than a thouſand; but the numbers which are viſible by means of a teleſcope, are very great.

A teleſcope is an inſtrument for viewing the heavenly bodies.

The Galaxy, or Milky-Way, is a cluſter of ſtars which illuminate that part of the firmament.

The heavens are divided into three regions, called the Northern and Southern hemiſpheres, and the Zodiac. The fixed ſtars were claſſed by the ancients under the outlines of certain figures of birds, beaſts, fiſhes, and other animals, called Conſtellations. The number of which is, in the Northern hemiſphere 36, in the Southern 32, and the Zodiac 12. Stars not comprehended in any conſtellation, are called Unformed Stars; and others of a cloudy appearance, are called Nebulæ. Of this number are the Magellanic clouds near the South pole, which reſemble two whitiſh ſpots in the heavens, and are well known to ſailors.

The laſt Star in the tail of Urſa Minor, or the Leſſer Bear, is called the Polar Star, and ſerves for a guide to mariners; becauſe, on account of its nearneſs to the North pole, its apparent ſituation, with regard to the Earth, ſcarcely varies throughout the period of the Earth's annual revolution. Two of the ſtars in the conſtellation of Urſa Major, or the Greater Bear, are called the Pointers, becauſe they point to the Polar Star.

During ſome part of July and Auguſt, Sirius, the dog-ſtar, riſes and ſets with the Sun; on which account thoſe days are called the Dog-days.

There are ſeveral little whitiſh ſpots in the heavens which appear luminous, without having any ſtars in them.

The Stella Mira, or Wonderful Star, has appeared and diſappeared ſeven times periodically in ſix years.

OF THE DIURNAL AND ANNUAL MOTIONS OF THE EARTH.

The ſucceſſion of day and night is occaſioned by the rotation of the Earth upon its axis, called its diurnal motion, and is performed in twenty-four hours; in that ſpace of time which we have one day and one night; and the difference of the ſeaſons by the annual motion of the Earth round the Sun.

It will be neceſſary, to enable us to give the young aſtronomer a plain idea of the diurnal and annual motions of the Earth, to deſcribe to him the circles of the ſphere.

An imaginary line paſſes through the centre of the globe, called its *Axis*; on which it turns round every twenty-four hours.

The oppoſite ends or points of this line are called the Poles of the Earth; the one, the

Arctic, or North Pole; the other the *Antartic*, or South Pole.

The *Equator*, or *Equinoctial Line*, divides the globe into two equal parts, or hemiſpheres; on this circle the degrees of longitude are marked.

The *Zodiac* is a broad circle that cuts the Equator obliquely. In this are the conſtellations, or ſtars that form the reſpective ſigns.

The *Ecliptic* is a line paſſing through the middle of the Zodiac; and ſhews the Sun's path or annual courſe.

The *Tropics* are two lines or

circles parallel with the Equator, and mark the limits of the Sun's motion towards the north and ſouth.

There are five *Zones*: one torrid, which is the ſpace on either ſide the Equator between the Tropics; two temperate, one north and the other ſouth of the torrid zone; and two frigid, northern and ſouthern, within the polar circles.

There are alſo thirty climates between the Equator and the North pole, and as many between the Equator and the South pole.

After this little illuſtration,

the following experiment will be found eaſy.

Bend a piece of wire into a circle, and let ſome perſon hold it even with a candle placed on a table, ſo that the candle may be exactly in the centre, then ſling an ivory ball (which may be had at any turner's ſhop) with a piece of thread, and twiſt it towards the left hand, ſo that when it untwiſts, it may go to the Eaſtward or to the right hand, at the ſame time moving the ball round the wire ſlowly; when the firſt motion will ſhew the days and nights, and the other the annual motion of the earth; but in this caſe, the days and nights would be equal, and the ſeaſons alike, which is not the caſe, as the Earth's orbit, repreſented by the wire, ſhould be inclined to the equator, a circle ſuppoſed to be drawn round the globe, in an angle of twenty-three degrees and a half; therefore, let the perſon who holds the wire raiſe it up at one ſide and depreſs it on the other, ſo that the candle may ſtill be exactly in the middle, then let the ball down to the lower part of the wire, and the candle which repreſents the

Sun will ſhine on the tropic of Cancer, and on all the countries from the equator to the North pole, which will have longer days and ſhorter nights, and thoſe countries towards the South pole exactly the reverſe.

In thoſe countries ſituated on the equator, the days and nights are equal.

FINIS.

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